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| 10/691,637 | 10/24/2003 | Satoshi Tokuda | SUT-0229 | 7634 |

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RADER FISHMAN & GRAUER PLLC
LION BUILDING
1233 20TH STREET N.W., SUITE 501
WASHINGTON, DC 20036

| EXAMINER | |
|---|---|
| BAKER, DAVID S | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2884 | |

DATE MAILED: 05/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/691,637 | TOKUDA ET AL. | |
| | Examiner | Art Unit | |
| | David S. Baker | 2884 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *13 April 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 9 recites the limitation "said source" and "said heat treatment" in paragraphs 5 and 8, respectively, of the claim. There is insufficient antecedent basis for this limitation in the claim. For examination purposes, the examiner has disregarded the antecedent terminology and read the claims as -- source -- and -- heat treatment --.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schiebel (US Patent #5,396,072 A) in view of McCandless (US Patent #6,251,701 B1).

Regarding claim 1, Schiebel discloses a radiation detector provided in a substrate with a detection layer (photoconductor detection layer 32, figure 3b, column 5 lines 6-49) which is sensitive to radiation, the detector comprising: said detection layer formed by a film comprising CdTe (column 5 lines 6-49, column 6 lines 46-65), and doped with Cl (column 6 lines 46-65). Schiebel does not disclose expressly that the CdTe is a polycrystal. McCandless discloses a radiation detector that utilizes a CdTe:Cl polycrystal detection layer (figure 2, column 3 lines 45-67, column 4 lines 1-15 and 46-54). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use a polycrystal CdTe layer as the detection layer of Schiebel. The motivation for doing so would have been to decrease the cost and improve the efficiency of the process of forming a CdTe microfilm. The method of McCandless can produce the radiation detection layer of Schiebel without the usual large amounts of liquid reactant and etching materials thereby cutting down the costs and waste of the production process. Additionally, CdTe:Cl polycrystal layers, CdTe:Cl monocrystal layers, and CdTe:Cl amorphorous layers are all well known in the art as functional equivalents of each other.

Regarding claim 2, McCandless discloses that the detection layer is formed by vapor deposition while using as a source, a mixture of CdTe and $CdCl_2$ (figure 2, column 3 lines 45-67, column 4 lines 1-15 and 46-54).

Regarding claim 3, McCandless discloses that the detection layer is formed in the condition that the substrate and source are located at a position to form a film by vapor deposition (figure 2, column 3 lines 45-67, column 4 lines 1-15 and 46-54).

Regarding claim 4, Schiebel discloses a radiation detector provided in a substrate with a detection layer (photoconductor detection layer 32, figure 3b, column 5 lines 6-49) which is sensitive to radiation, the detector comprising: said detection layer formed by a film comprising CdTe (column 5 lines 6-49, column 6 lines 46-65), and doped with Cl (column 6 lines 46-65). Schiebel does not disclose expressly that the CdTe is a polycrystal or that the doping process comprises heating while supplying the detection layer with a vapor containing Cl atoms. McCandless discloses a radiation detector that utilizes a CdTe:Cl polycrystal detection layer (figure 2, column 3 lines 45-67, column 4 lines 1-15 and 46-54) and that the doping process comprises heating while supplying the detection layer with a vapor containing Cl atoms (figure 2, column 3 lines 45-67, column 4 lines 1-15 and 46-54). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use a polycrystal CdTe layer as the detection layer of Schiebel. The motivation for doing so would have been to decrease the cost and improve the efficiency of the process of forming a CdTe microfilm. The method of McCandless can produce the radiation detection layer of Schiebel without the usual large amounts of liquid reactant and etching materials thereby cutting down the costs and waste of the production process. Additionally, CdTe:Cl polycrystal layers, CdTe:Cl monocrystal layers, and CdTe:Cl amorphorous layers are all well known in the art as functional equivalents of each other.

Regarding claim 5, McCandless discloses that the detector is doped with Cl by conducting heat treatment in the condition that powder containing $CdCl_2$ is opposed to the detection layer (figure 2, column 3 lines 45-67, column 4 lines 1-15 and 46-54).

Regarding claims 6 and 7, McCandless discloses that the heat treatment is carried out under atmosphere containing $H_2$ kept at $1.3x10^{-3}$ to 1 atmospheric pressure (column 3 lines 45-67, column 4 lines 1-15 and 46-54).

Regarding claim 8, Schiebel discloses a radiation detector provided in a substrate with a detection layer (photoconductor detection layer 32, figure 3b, column 5 lines 6-49) which is sensitive to radiation, the detector comprising: said detection layer formed by a film comprising CdTe (column 5 lines 6-49, column 6 lines 46-65), and doped with Cl (column 6 lines 46-65). Schiebel does not disclose expressly that the CdTe is a polycrystal or that the doping process comprises heating while supplying the detection layer with a vapor containing Cl atoms. McCandless discloses a radiation detector that utilizes a CdTe:Cl polycrystal detection layer (figure 2, column 3 lines 45-67, column 4 lines 1-15 and 46-54) and that the doping process comprises heating while supplying the detection layer with a vapor containing Cl atoms (figure 2, column 3 lines 45-67, column 4 lines 1-15 and 46-54). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use a polycrystal CdTe layer as the detection layer of Schiebel. The motivation for doing so would have been to decrease the cost and improve the efficiency of the process of forming a CdTe microfilm. The method of McCandless can produce the radiation detection layer of Schiebel without the usual large amounts of liquid reactant and etching materials thereby cutting down the costs and waste of the production process. Additionally, CdTe:Cl polycrystal layers, CdTe:Cl monocrystal layers, and CdTe:Cl amorphorous layers are all well known in the art as functional equivalents of each other.

Regarding claim 9, Schiebel discloses a radiation detector provided in a substrate with a detection layer (photoconductor detection layer 32, figure 3b, column 5 lines 6-49) which is sensitive to radiation, the detector comprising: said detection layer formed by a film comprising CdTe (column 5 lines 6-49, column 6 lines 46-65), and doped with Cl (column 6 lines 46-65). Schiebel does not disclose expressly that the CdTe is a polycrystal. McCandless discloses a radiation detector that utilizes a CdTe:Cl polycrystal detection layer (figure 2, column 3 lines 45-67, column 4 lines 1-15 and 46-54). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use a polycrystal CdTe layer as the detection layer of Schiebel. The motivation for doing so would have been to decrease the cost and improve the efficiency of the process of forming a CdTe microfilm. The method of McCandless can produce the radiation detection layer of Schiebel without the usual large amounts of liquid reactant and etching materials thereby cutting down the costs and waste of the production process. Additionally, CdTe:Cl polycrystal layers, CdTe:Cl monocrystal layers, and CdTe:Cl amorphorous layers are all well known in the art as functional equivalents of each other.

Regarding claims 10-12, Schiebel discloses a plurality of charge accumulation capacitors (capacitors 2, figure 1) for accumulating charges (column 5 lines 67-68, column 6 lines 1-38) from the detection layer (photoconductive detection layer 32, figure 3b) and a switching matrix substrate including switching devices (switches 1, figure 1) arranged in an array (figure 1), wherein the switching devices read out charges of the plurality of charge accumulation capacitors (column 5 lines 67-68, column 6 lines 1-38).

Regarding claim 13, Schiebel discloses a switching matrix substrate including switching devices (switches 1, figure 1) arranged in an array (figure 1), wherein the switching devices read out charges of the plurality of charge accumulation capacitors (column 5 lines 67-68, column 6 lines 1-38).

Regarding claims 14-16, Schiebel discloses a plurality of charge accumulation capacitors (capacitors 2, figure 1) for accumulating charges (column 5 lines 67-68, column 6 lines 1-38) from the detection layer (photoconductive detection layer 32, figure 3b) and a switching matrix substrate including switching devices (switches 1, figure 1) arranged in an array (figure 1), wherein the switching devices read out charges of the plurality of charge accumulation capacitors (column 5 lines 67-68, column 6 lines 1-38).

Regarding claim 17, Schiebel discloses a plurality of charge accumulation capacitors (capacitors 2, figure 1) for accumulating charges (column 5 lines 67-68, column 6 lines 1-38) from the detection layer (photoconductive detection layer 32, figure 3b) and a switching matrix substrate including switching devices (switches 1, figure 1) arranged in an array (figure 1), wherein the switching devices read out charges of the plurality of charge accumulation capacitors (column 5 lines 67-68, column 6 lines 1-38).

Regarding claim 18, Schiebel discloses a plurality of charge accumulation capacitors (capacitors 2, figure 1) for accumulating charges (column 5 lines 67-68, column 6 lines 1-38) from the detection layer (photoconductive detection layer 32, figure 3b) and a switching matrix substrate including switching devices (switches 1, figure 1) arranged in an array (figure 1), wherein the switching devices read out charges of the plurality of charge accumulation capacitors (column 5 lines 67-68, column 6 lines 1-38).

Regarding claim 19, Schiebel discloses a radiation detector provided in a substrate with a detection layer (photoconductor detection layer 32, figure 3b, column 5 lines 6-49) which is sensitive to radiation, the detector comprising: said detection layer formed by a film comprising CdTe (column 5 lines 6-49, column 6 lines 46-65), and doped with Cl (column 6 lines 46-65). Schiebel does not disclose expressly that the CdTe is a polycrystal. McCandless discloses a radiation detector that utilizes a CdTe:Cl polycrystal detection layer (figure 2, column 3 lines 45-67, column 4 lines 1-15 and 46-54). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use a polycrystal CdTe layer as the detection layer of Schiebel. The motivation for doing so would have been to decrease the cost and improve the efficiency of the process of forming a CdTe microfilm. The method of McCandless can produce the radiation detection layer of Schiebel without the usual large amounts of liquid reactant and etching materials thereby cutting down the costs and waste of the production process. Additionally, CdTe:Cl polycrystal layers, CdTe:Cl monocrystal layers, and CdTe:Cl amorphorous layers are all well known in the art as functional equivalents of each other.

Regarding claim 20, McCandless discloses that the detection layer is formed by vapor deposition while using as a source, a mixture of CdTe and $CdCl_2$ (figure 2, column 3 lines 45-67, column 4 lines 1-15 and 46-54).

***Response to Amendment***

6. The amendment filed on 04/13/2006 is accepted and entered.

***Response to Arguments***

7. Applicant's arguments filed 04/13/2006 have been fully considered but they are not persuasive.

Regarding paragraphs 2 and 5 of page 14 of the amendment, the examiner notes that the semiconductor layer is not the detection layer. However, Schiebel still discloses that the photoconductive detection layer may be composed of CdTe (column 6 lines 46-65).

Regarding paragraph 7 of pager 14 of the amendment, the examiner respectfully disagrees with the applicant. The examiner would like to remind the applicant that process limitations do not serve to impart patentability to structures. *In re Dike*, 157 USPQ 581, 585 (CCPA 1968). Methods of making a claimed product are immaterial in a product claim in view of *In re Thorpe*, 777 F.2d 695, 227 USPQ 964 (Fed. Cir. 1985) and *In re Brown*, 459 F.2d 531, 173 USPQ 685 (CCPA 1972). It is axiomatic that the additional presence of process limitations, no matter how detailed, cannot impart patentability to a product. *In re Pilkington*, 411 F.2d 1345, 162 USPQ 145 (CCPA 1969); *In re Johnson*, 394 F.2d 591, 157 USPQ 620 (CCPA 1968); and *In re Stephen*, 345 F.2d 1020, 145 USPQ 656 (CCPA 1965).

Regarding paragraph 8 of page 14 and paragraph 7 of page 15 of the amendment, the examiner respectfully disagrees with the applicant. Those skilled in the art will appreciate than dry air is well known to be approximately composed of 78.084% $N_2$, 20.9476% $O_2$, 0.934% Ar, 0.001818% Ne, 0.000524% He, 0.00005% $H_2$, and other trace

gases. This satisfies the claim limitation that the heat treatment's atmosphere is composed of at least one of $N_2$, $O_2$, $H_2$, He, Ne, and Ar.

Regarding paragraphs 1 and 2 of page 16 of the amendment, the examiner respectfully disagrees with the applicant. In response to applicant's argument that there is no suggestion of using the p-type tellurium-containing II-IV semiconductor in substantially the same manner as the layers found within Schiebel, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In this case, the McCandless reference is being cited merely for the teaching of why one skilled in the at would have been motivated to utilize any one of the well-known functional equivalent forms of a cadmium telluride detecting material.

Regarding paragraph 1 of page 16 of the amendment, the examiner respectfully disagrees with the applicant. As noted above, the use of polycrystal, monocrystal, or amorphous CdTe is well known in the art as functional equivalents. As evidence of the well-known functional equivalence thereof, the examiner calls the Applicant's attention to Morton (US Patent #5,693,947 A), specifically, column 10 lines 43-47. Also as noted above, the use of CdTe or CdTe:Cl is well known in the art as functional equivalents. As evidence of the well-known functional equivalence thereof, the examiner calls the Applicant's attention to Verger (US Patent #6,420,710 B1), specifically, column 5 lines 5-19.

***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

US Patent #6,344,370 B1 – Izumi discloses a radiation detection layer of CdTe:Cl formed by vapor deposition of CdTe and a heat treatment to dope the CdTe polycrystal with Cl.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Baker whose telephone number is 571-272-6003 and email address is david.baker@uspto.gov. The examiner can normally be reached on MTWRF 10:30-7:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ALBERT J. GAGLIARDI
PRIMARY EXAMINER

David S Baker
Examiner
Art Unit 2884

DSB